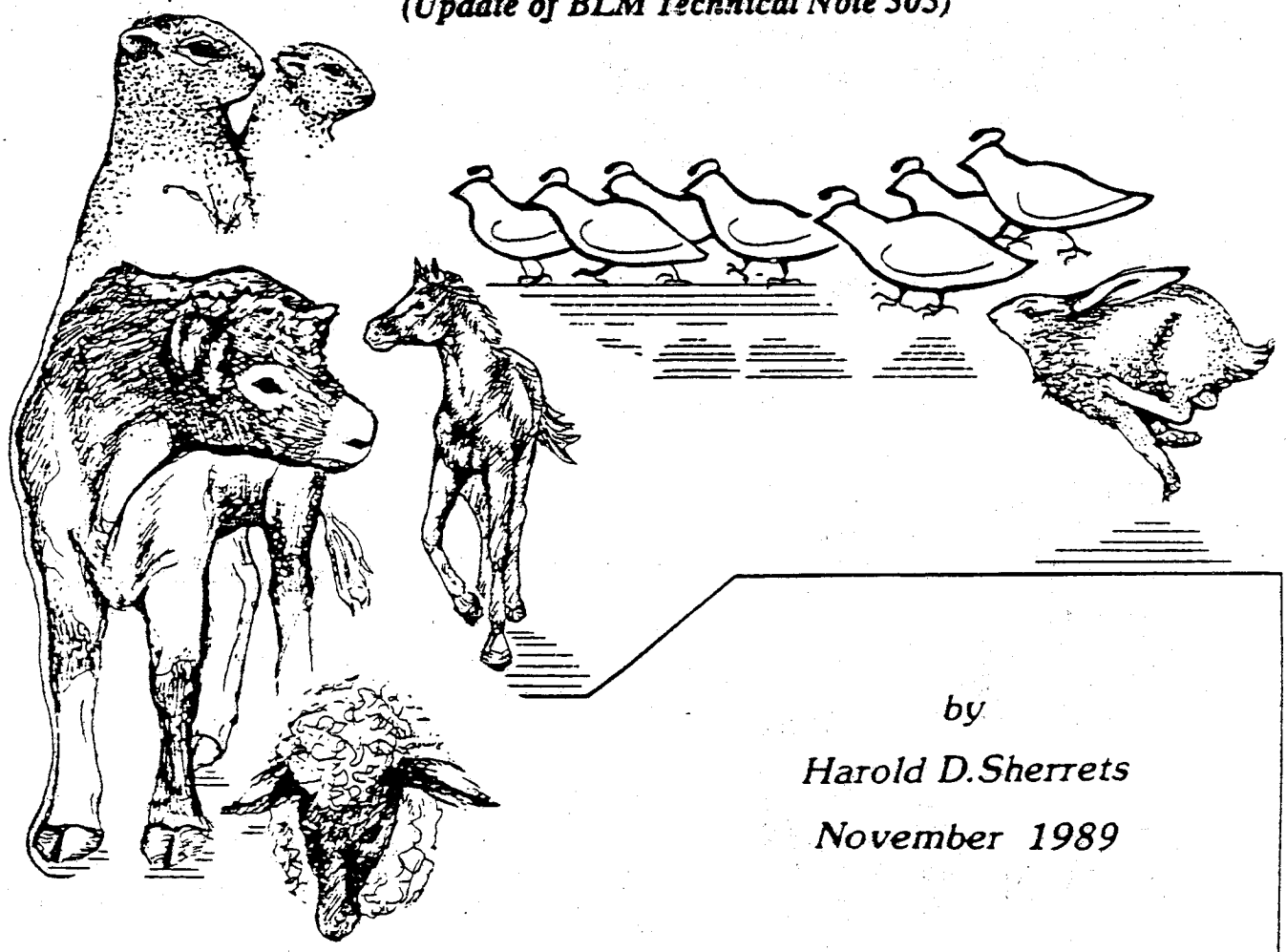
Idaho BLM Technical Bulletin 89-4

Wildlife Watering and Escape Ramps on Livestock Water Developments: Suggestions and Recommendations

(Update of BLM Technical Note 305)



by

Harold D. Sherrets

November 1989

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Idaho State Office
3380 Americana Terrace
Boise, Idaho 83706

Table of Contents

Idaho BLM Technical Bulletin 89-4

Wildlife Watering and Escape Ramps on Livestock Water Developments: Suggestions and Recommendations

(Update of BLM Technical Note 305)

by Harold D. Sherrets

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Idaho State Office
3380 Americana Terrace
Boise, Idaho 83706

May 1989

Introduction

September 1977, Lanny Wilson wrote Technical Note 305 entitled *Guidelines and Recommendations for Design and Modification of Livestock Watering Developments to Facilitate Safe Use by Wildlife.* This Technical Note has been the Bureau's guide for identifying wildlife escape ramps. There have been some additional livestock and wildlife water systems developed since 1977. Thus it appears timely that Technical Note 305 be updated to reflect current information. This Technical Bulletin has been updated with the assistance of many people and information from many sources. Unfortunately we are not able to acknowledge everyone's contribution other than giving them our sincere thanks.

The need for wildlife escape ramps (bird ladders) continues today as it has in the past. Some water troughs have been placed by cooperators that do not lend themselves to use of a standard type escape ramp. Thus when these types of troughs are placed on public land, they must have suitable escape ramps provided.

General Guidelines

Livestock waterers have historically been developed to permit livestock access to a water source. Many of these would not be available for livestock if they had not been collected in a container, especially during dryer periods of the year. The situation still exists today. However, many new water developments are from wells or water diversions where water is piped to areas having no previous dependable water source. In many instances, livestock use in the past was only in the spring, fall, or winter. Today, those ranges can be used during the summer by livestock because of seedings and water development. Wildlife in the past made do with the available water or traveled further for water than livestock. In some instances, livestock waterers have enabled more wildlife to use an area because of dependable water.

If all available water is captured and the only water outlet source is a trough, wildlife water should be provided through an alternative water outlet. If sufficient water is available, an overflow outlet a little distance from the livestock trough will normally meet wildlife needs. It is best to fence overflow areas so livestock do not trample the outlets.

In situations where wildlife water is to be available season long (as a mitigating measure to provide livestock water in an area not previously having water), the primary beneficiaries of the livestock water should agree to provide wildlife waters during times livestock is not present (except for winter months).

New types of troughs proposed for placement on public land must have an escape devise designed and installed that will enable small wildlife to escape from the trough. The design must be such that wildlife will be intercepted as they swim around the outside edge of the trough and not get trapped behind the ramp or miss the ramp entirely.

Livestock Trough Modifications

Immature wild ungulates (fawn deer, bighorn sheep lambs, calf elk, antelope kids, etc.) cannot utilize watering facilities that exceed 20 inches above ground level (Illustration 1). *Wherever ground-level wildlife drinking facilities are not provided in association with other water developments, the height of*

livestock troughs or other containers must not exceed 20 inches. Larger troughs may be set below ground level to reach the desired height (Illustration 2).

Often cattle, domestic sheep, wild horses, and other large ungulates will push, crowd, or fight adjacent to a water facility. With the lip of the trough 20 inches above ground level there is the possibility of some ungulates (e.g., domestic sheep, calves, fawn deer, antelope, etc.) falling into the trough. If the water level exceeds 20 inches, the animal may not be able to reach the bottom and stand.

Consider installing safety barricades in all livestock watering developments to prevent accidental entry and possible drowning (Illustrations 3a and 3b). The horizontal distance from the rim of the trough to the barricade also must not exceed 20 inches (Illustration 2).

In addition, escape from a trough by a large ungulate may be more difficult than an accidental entry. *Consider installation of concrete blocks and/or rocks to form escape ramps in all livestock water facilities where water depth exceeds 20 inches* (Illustrations 2, 16, 23, and 25).

If the quantity of water is insufficient to provide separate livestock and wildlife developments, the livestock facility must serve a dual role. This can be accomplished by constructing wildlife ladders which lead into water facilities (Illustrations 4, 5, 6, and 22). *These ladders can be constructed of expanded metal or rebar and hardware cloth and should be protected by posts or protective fencing.*

An alternative method of providing access by small animals to raised troughs is to construct concrete or rock ramps topped with concrete (Illustration 7). Advantages of such ramps include minimal maintenance and decreased chance of injury to livestock. Protective fencing would be optional if concrete/rock ramps are used.

Perhaps the most important open trough modifications to small wildlife are escape ramps or ladders installed inside the troughs. *Illustrations 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 23, 24, and 25 show the recommended wildlife escape ladder construction for most types of livestock troughs.* Dimensions can be changed accordingly, but the following general design guidelines should be followed.

Birds, lizards, rodents, rabbits, and other small animals generally swim the circumference of a tank trying to find their way out. Therefore, *wildlife escape ladders must be constructed and installed to intercept the line of travel around the edge of the tank* (Illustrations 10, 11, 19, and 24). Improper screening may result in animals being trapped and drowned (Illustration 12).

All wildlife escape ladders should be attached to the watering facility by a hinge or bracket to facilitate trough and ladder cleaning and to reduce the possibility of the ladder being removed (Illustration 9, 13, and 18). Brackets have proven to be more effective than hinges. If not installed properly, hinges tend to bind and will break with prolonged use.

Wildlife escape ladders should have a minimum slope of 30 degrees and a maximum of 45 degrees (Illustrations 8, 9, 12, 13, 16, 17, and 18). The more gradual the slope of an escape ladder the more effective it will be.

A minimum of one escape ladder per 30 linear feet of trough perimeter should be installed (Illustrations 10 and 11). Information suggests that many small animals become exhausted and drown if forced to swim more than 30 feet. Where troughs are connected in a series (such as 3-10ft. troughs), each trough must have escape ladders.

It is possible to make wildlife escape ramps or ladders serve purposes other than wildlife protection. In water facilities where float valves are installed, the escape ramp may provide a protective cover for the valve, as well as a landing from which animals can drink and a method by which trapped animals can escape (Illustrations 13, 18, 23, and 25).

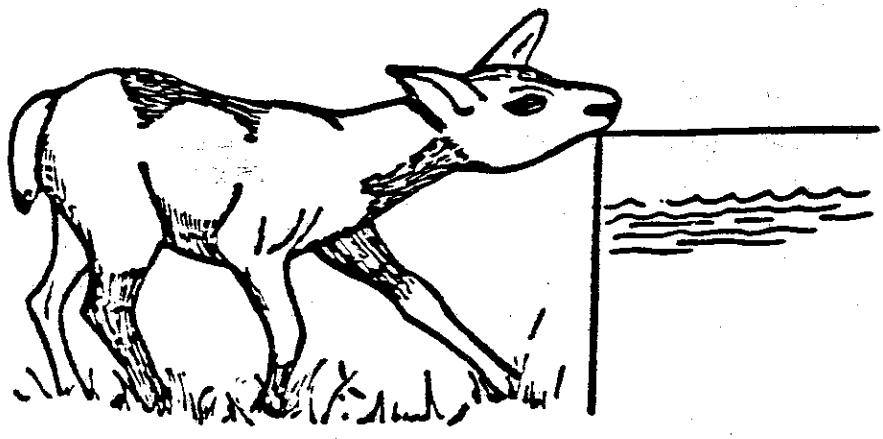
A new water trough being used is made from large earth moving equipment tires. The size of these tires may vary considerably. No one type of escape ladder or ramp has been developed for tire type troughs that has proven totally effective. Bears will utilize tire troughs. In using the troughs they knock all pipes and obstructions from the tire. Thus, any ramp used in

tire troughs should be resilient and/or easily replaceable. See Illustrations 16 and 17 for various ladders that may be suitable for tire troughs where bears are not a problem.

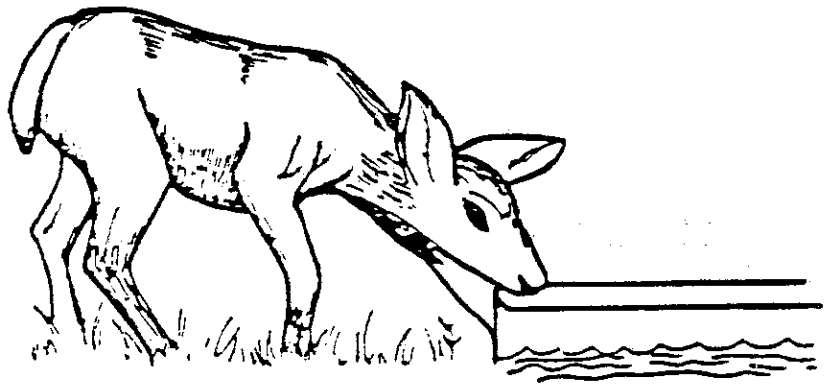
Open Storage Tank Modifications

In many grazing areas large open water storage tanks are used. The majority are out of reach of livestock, big game animals, and most small wildlife species (except birds and bats). The livestock trough modifications described in the previous section are impractical, and usually unnecessary in storage tanks. Some provision to allow trapped birds to escape the deep water is needed.

A floating wildlife platform should be installed in all large open water storage tanks (Illustrations 14, 15, and 20). Such a platform will allow birds to escape or to drink.

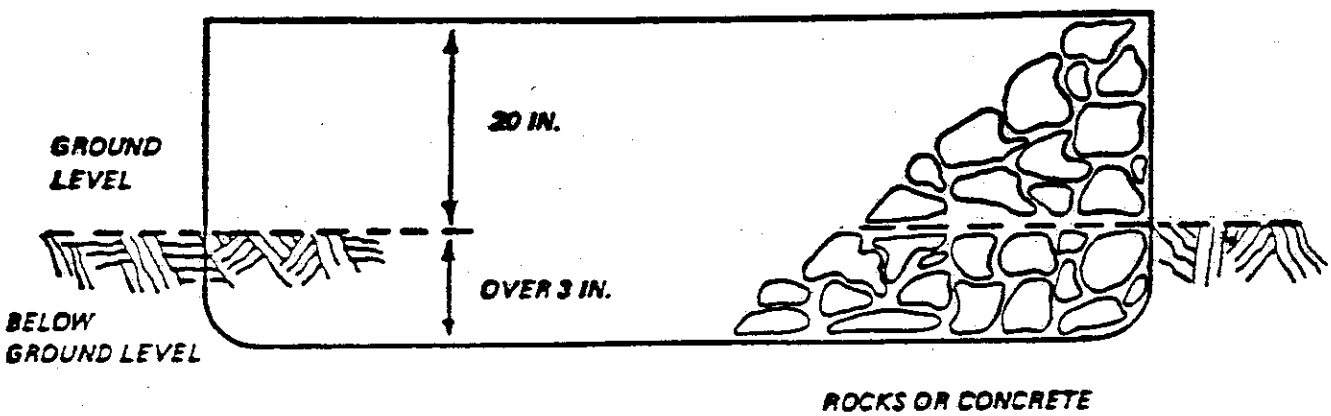


Trough height above 20 in. water not available.



Trough height 20 in. or less water is available.

ILLUSTRATION 1: These two drawings illustrate the need for trough height not to exceed 20 inches above ground level.



SIDE VIEW

ILLUSTRATION 2: Placing of rocks, concrete blocks or other ramp facilities provide an escape route for large ungulates, where the water depth exceeds 20 inches.

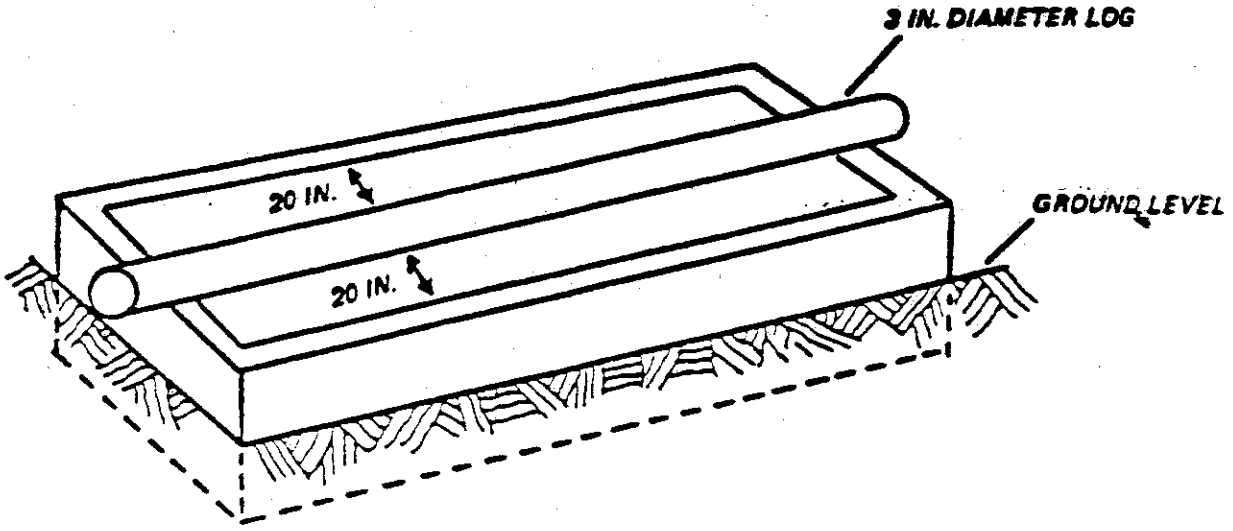


ILLUSTRATION 3 a: Possible barricade developments depending on livestock trough configuration.

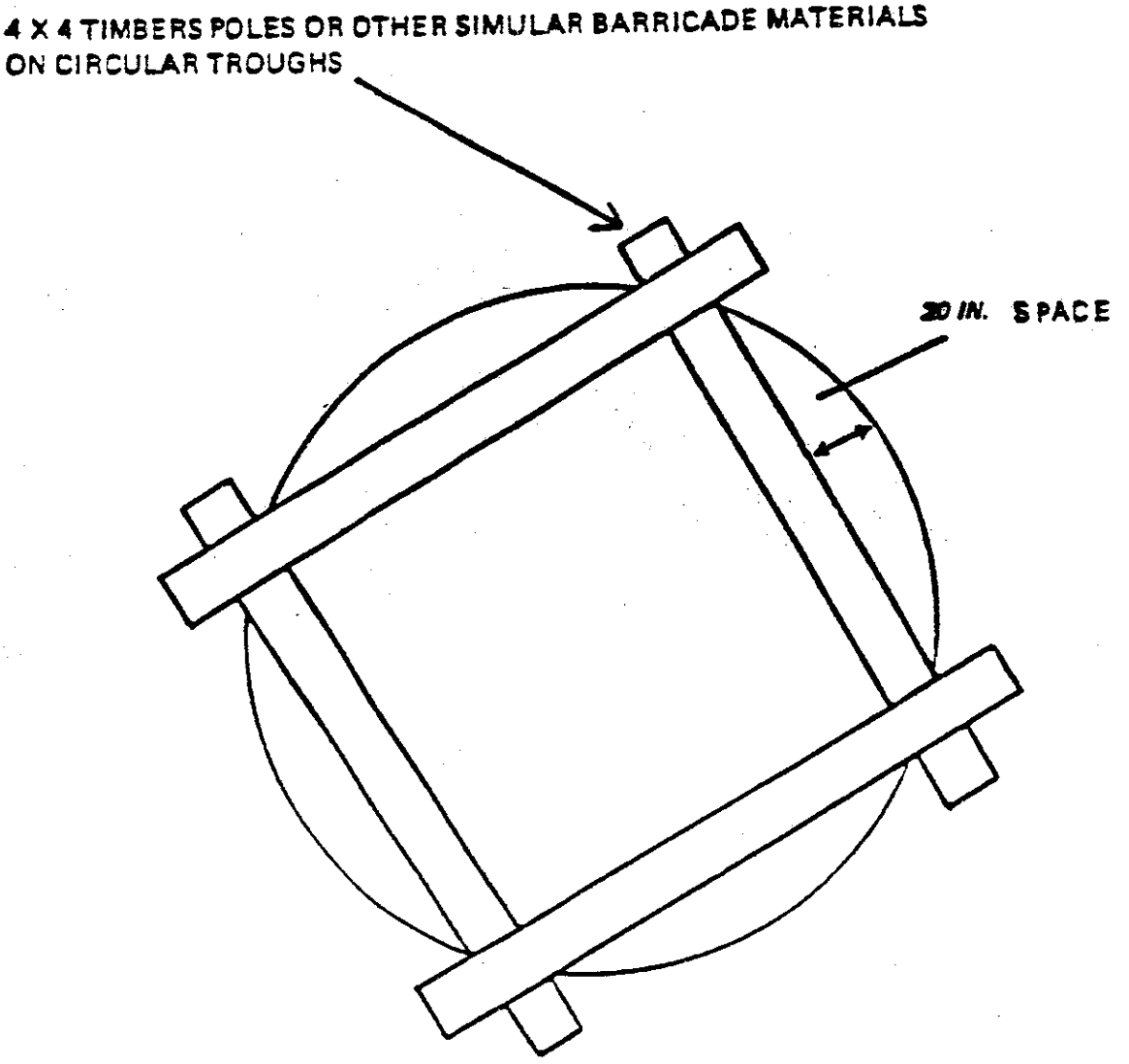


ILLUSTRATION 3b: Possible barricade developments depending on livestock trough configuration.

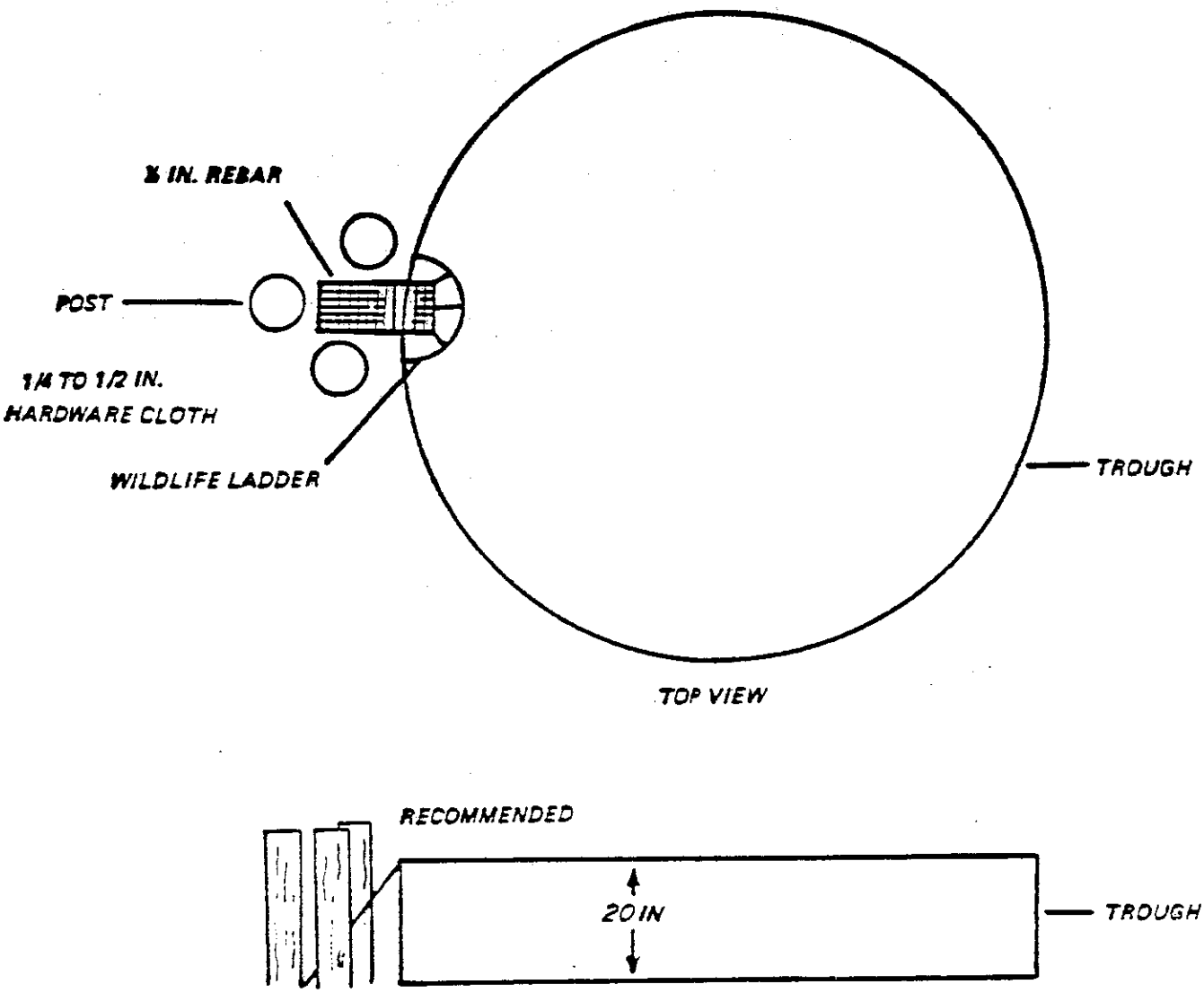


ILLUSTRATION 4: Post around wildlife ladders leading into a livestock trough will reduce chances of damage to the ladder and injuries to large ungulates.

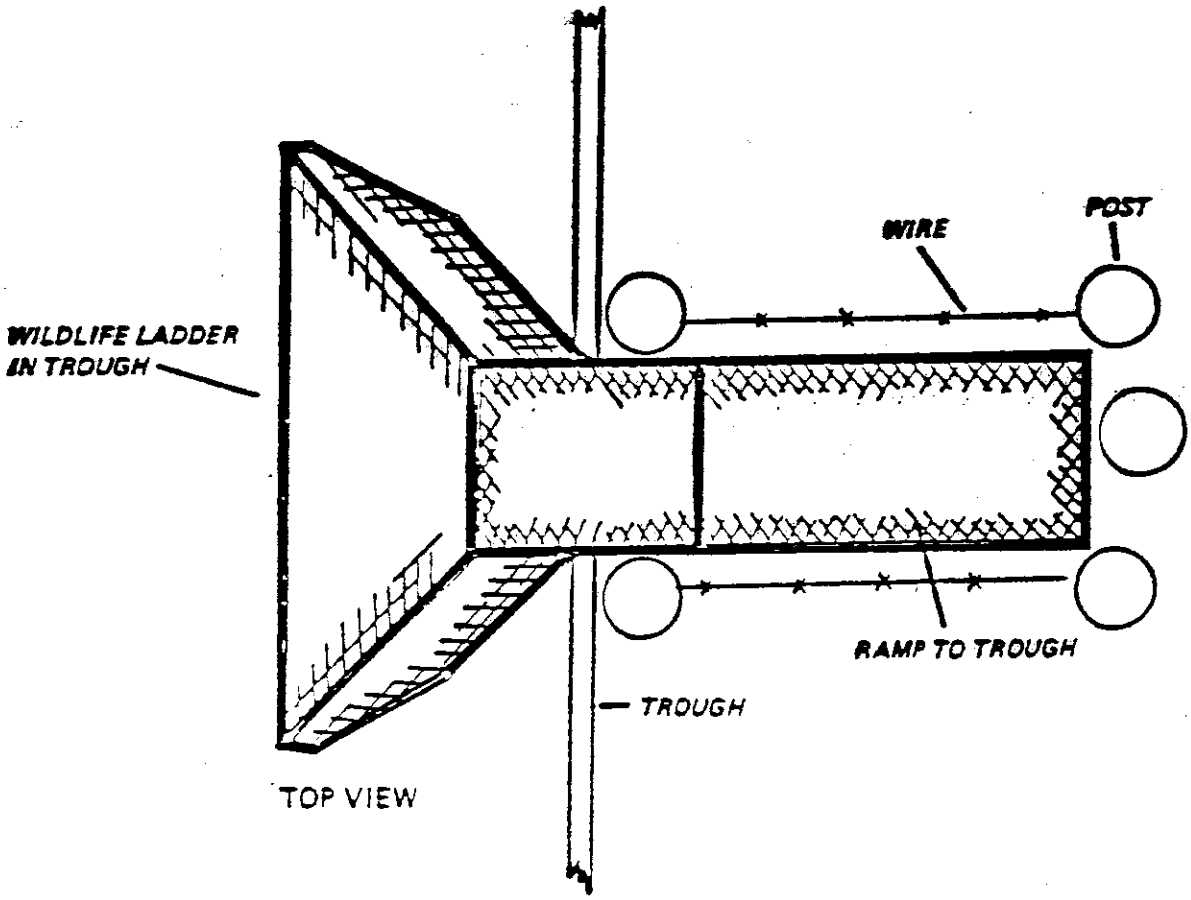


ILLUSTRATION 5: Fencing and post arrangement to protect wildlife ramp leading into a livestock watering facility.

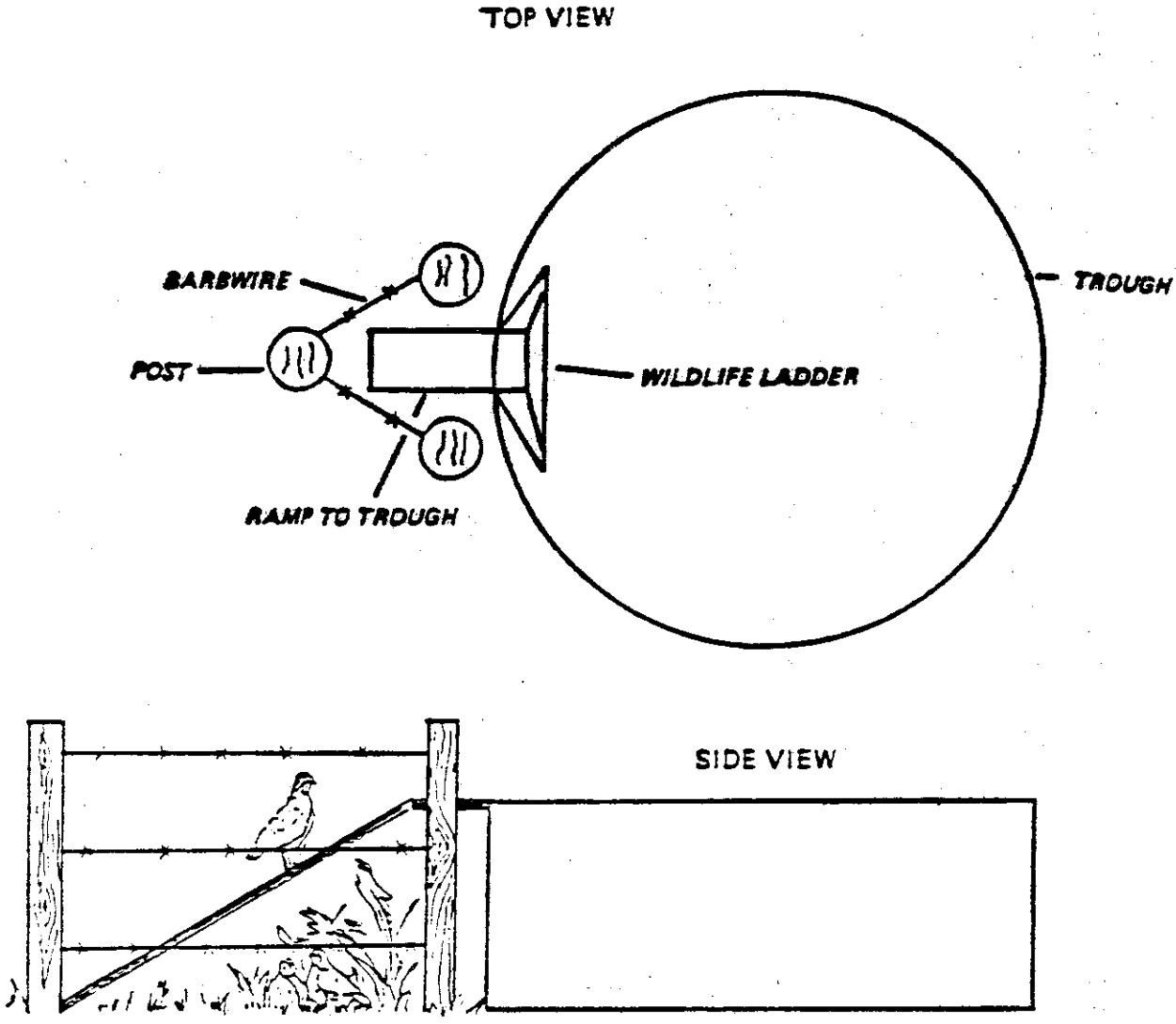


ILLUSTRATION 6: Protective fencing of wildlife ladders leading into livestock water facility will result in the establishment of protective cover for wildlife.

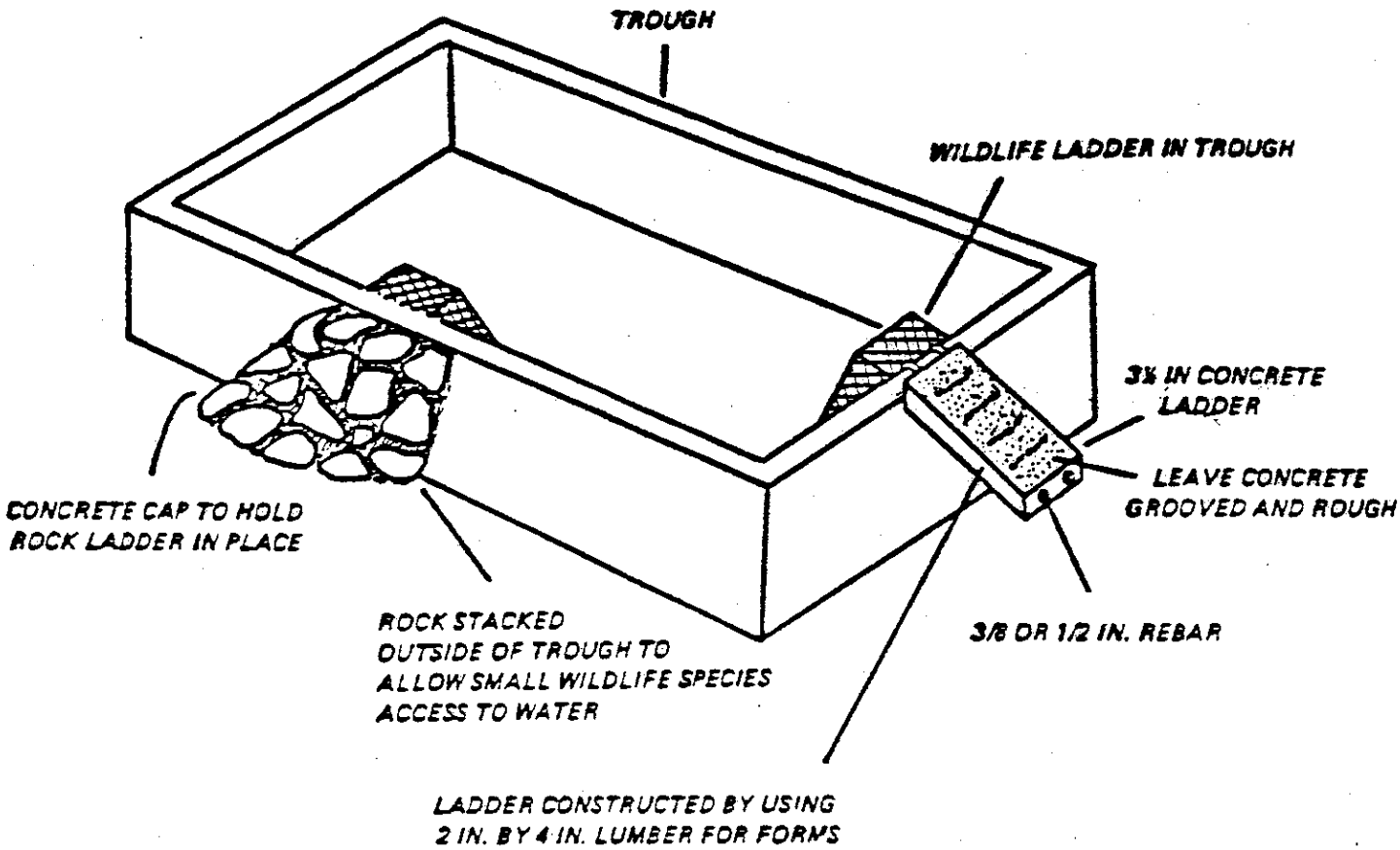


ILLUSTRATION 7: Concrete ramps or rock ramps capped by concrete into livestock trough can withstand trampling by large ungulates and protective fencing is optional.

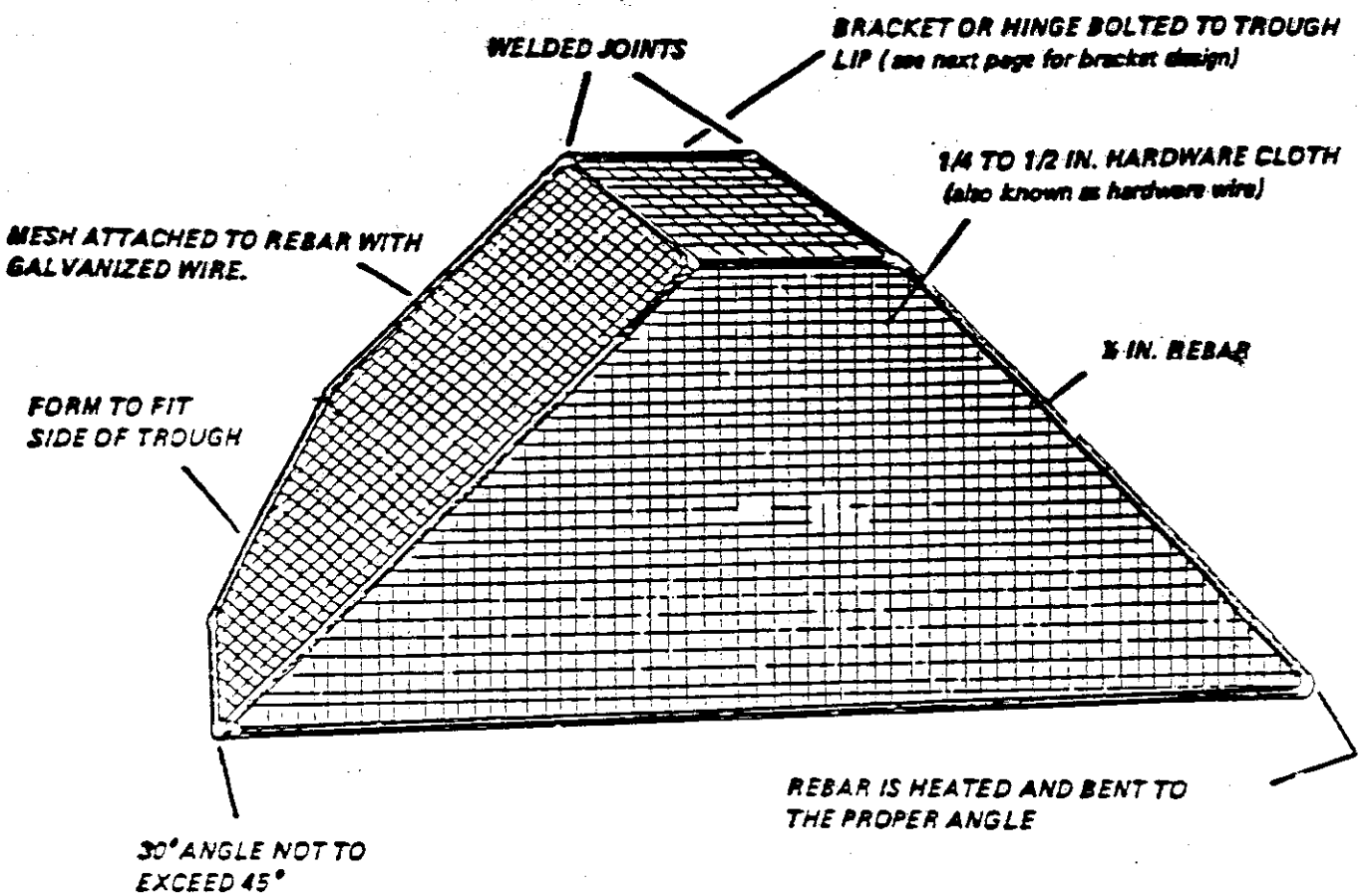
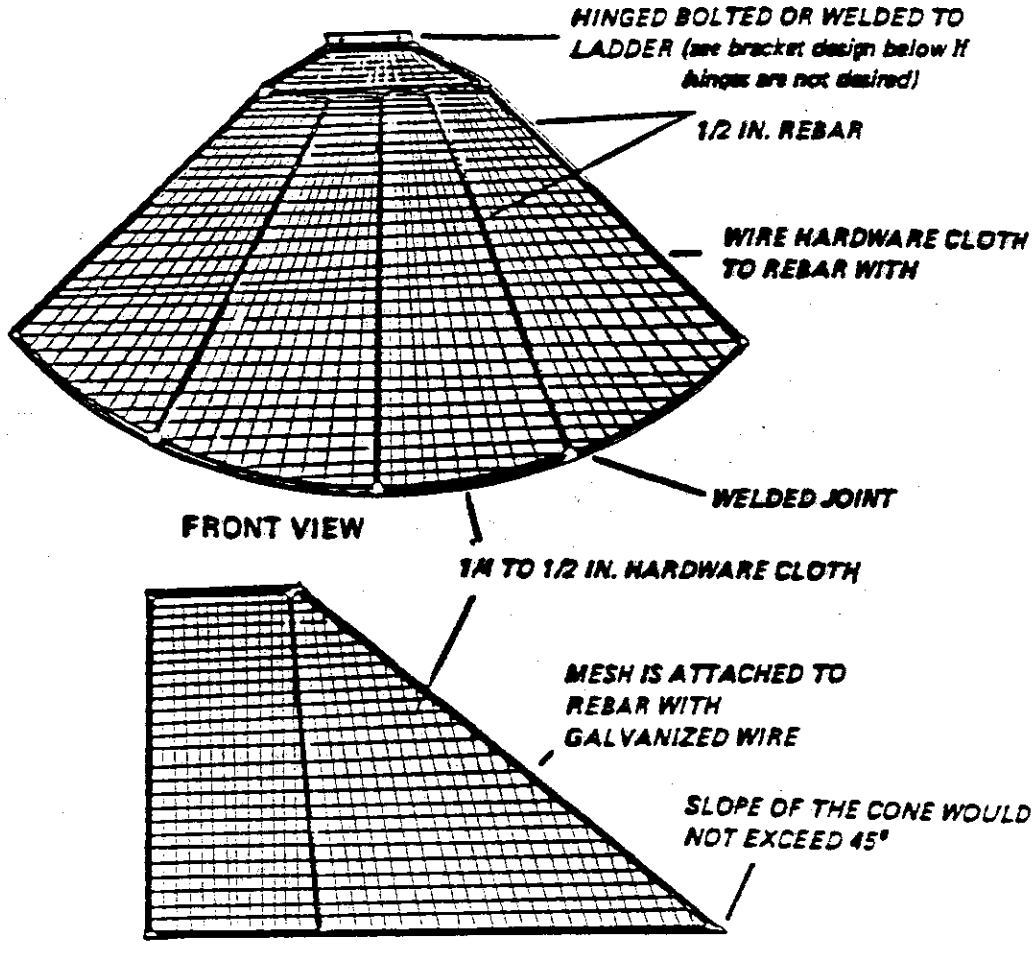


ILLUSTRATION 8: Triangular shaped wildlife ladder recommended rectangular and concave bottom trough.



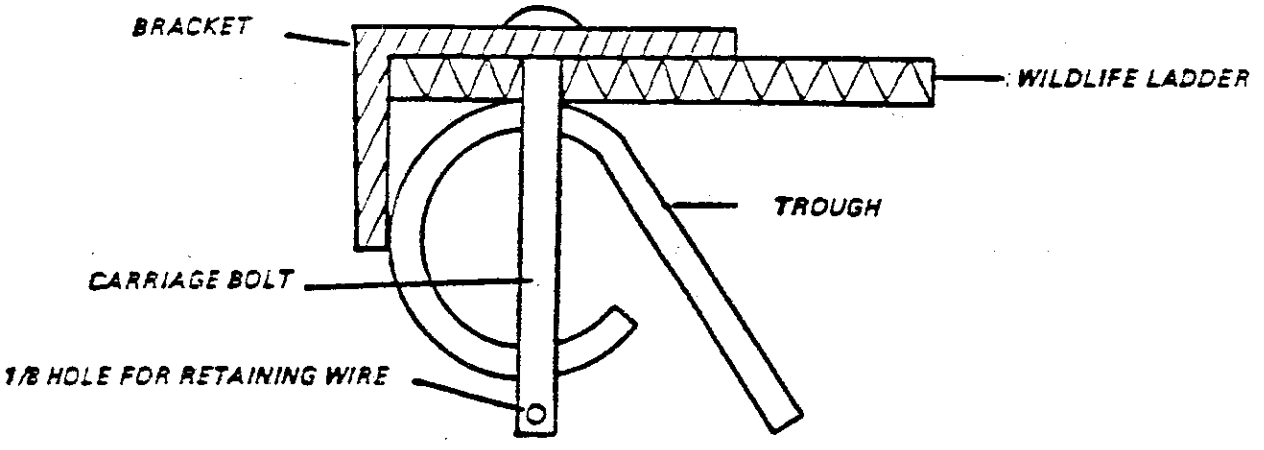


ILLUSTRATION 8: Cone shaped wildlife ladders are recommended for circular troughs.

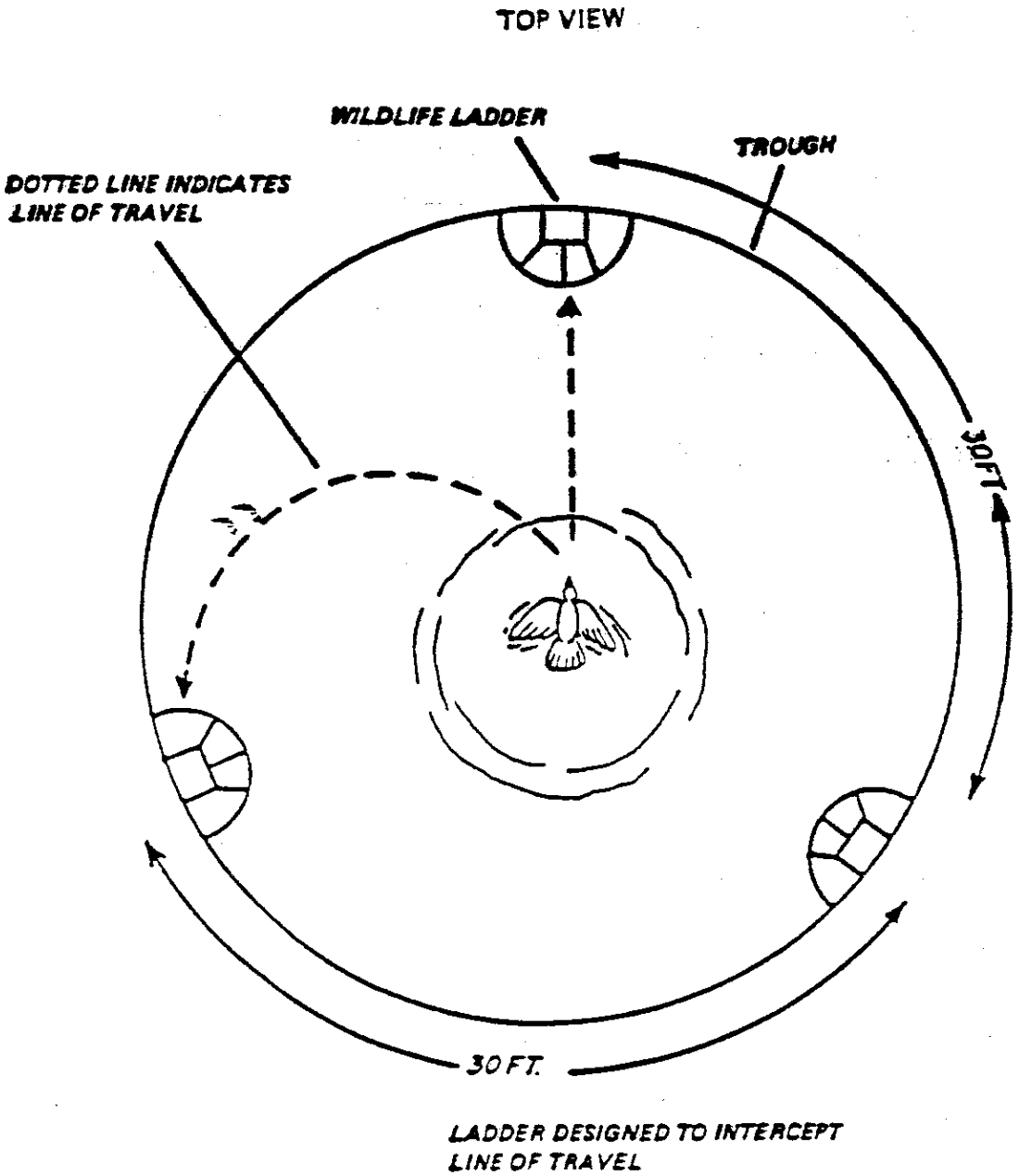
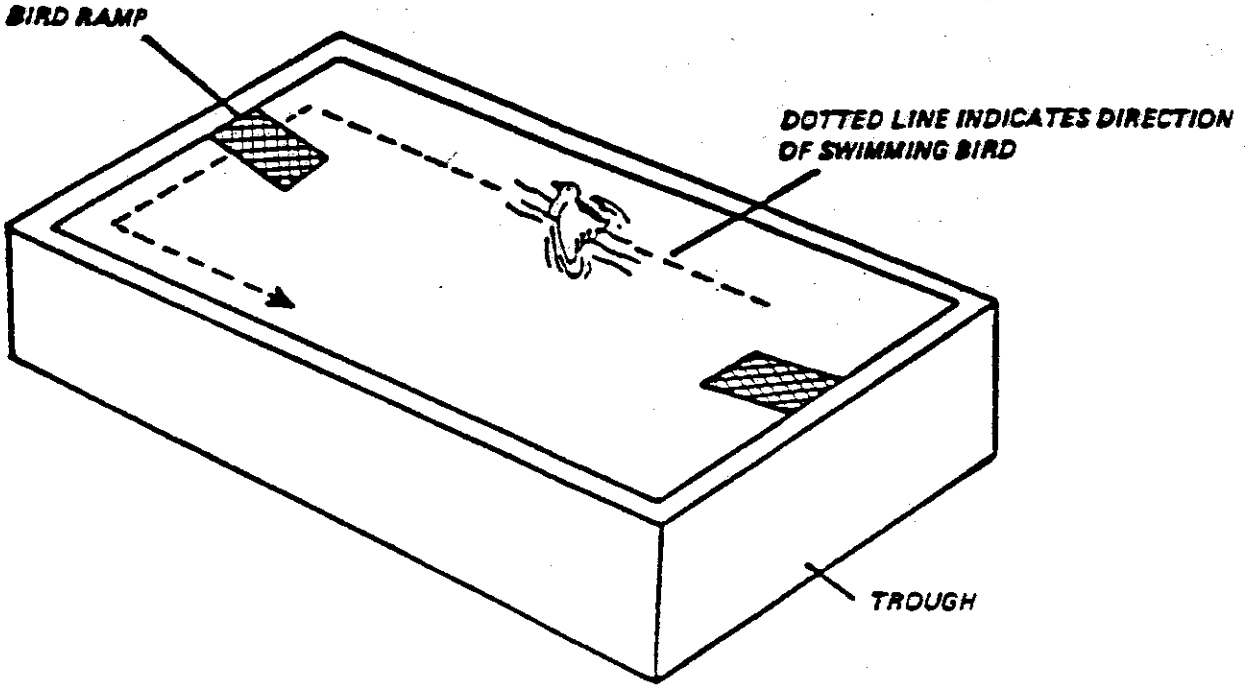
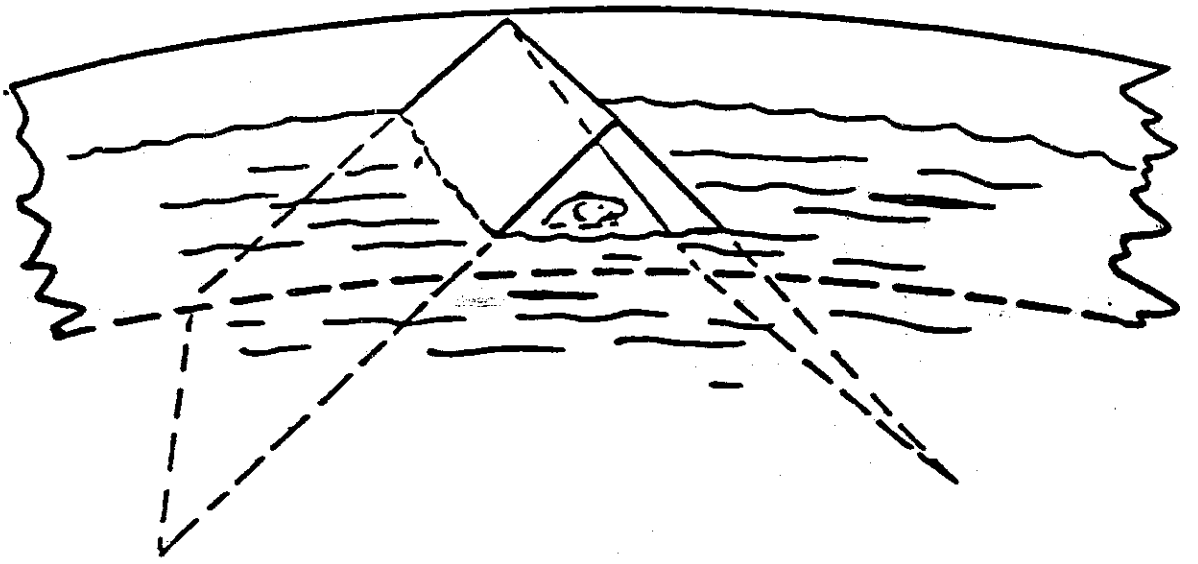


ILLUSTRATION 10: This drawing depicts probable swimming patterns from an animal falling into a circular trough. The wildlife ladders are properly installed. A minimum of one ladder per 30 ft. of trough perimeter is recommended.

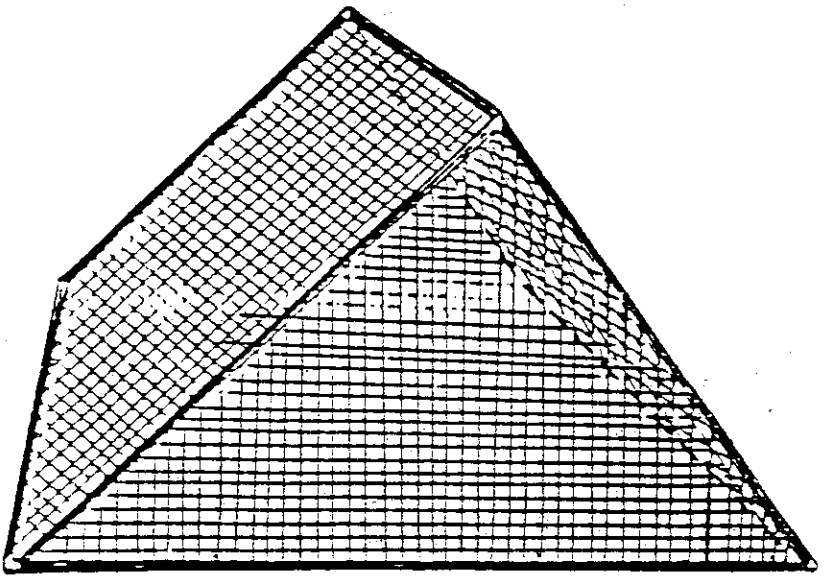


WILDLIFE LADDER, BIRD RAMP AT A 45° ANGLE TO TROUGH DOES NOT INTERCEPT LINE OF TRAVEL

ILLUSTRATION 11: Drawing depicts line of swimming pattern of an animal falling in a livestock watering trough and the probable problem with improperly designed wildlife ladder.



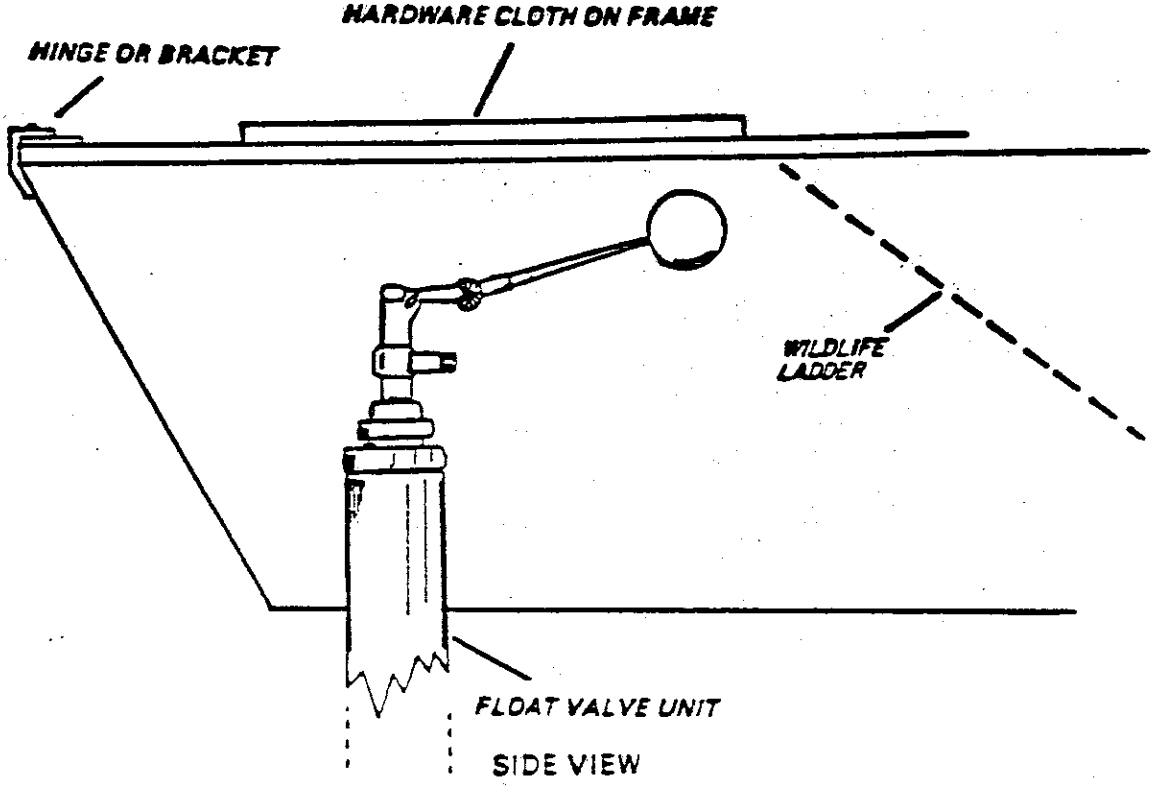
Improperly designed wildlife ladders can result in an animal becoming entrapped.



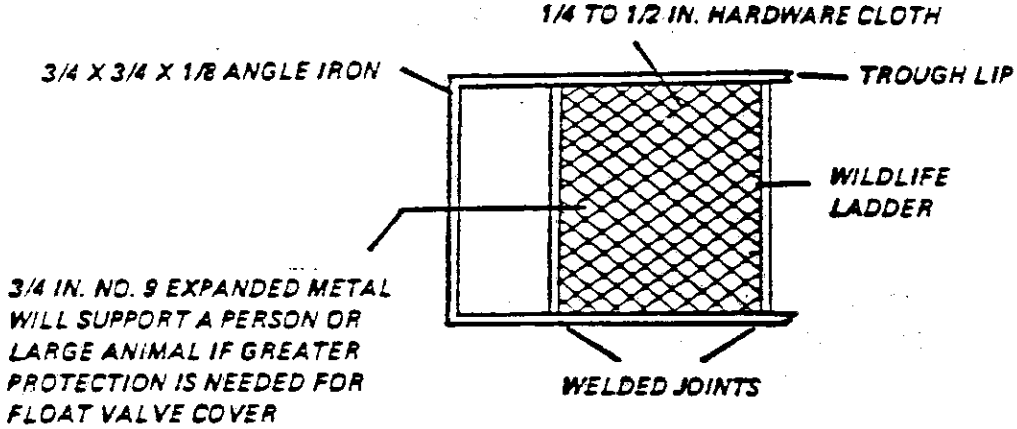
Closing the ladder opening makes it safe.

ILLUSTRATION 12

ILLUSTRATION 13: Float valve protective cover — wildlife ladder serves three purposes.



SIDE VIEW



TOP VIEW

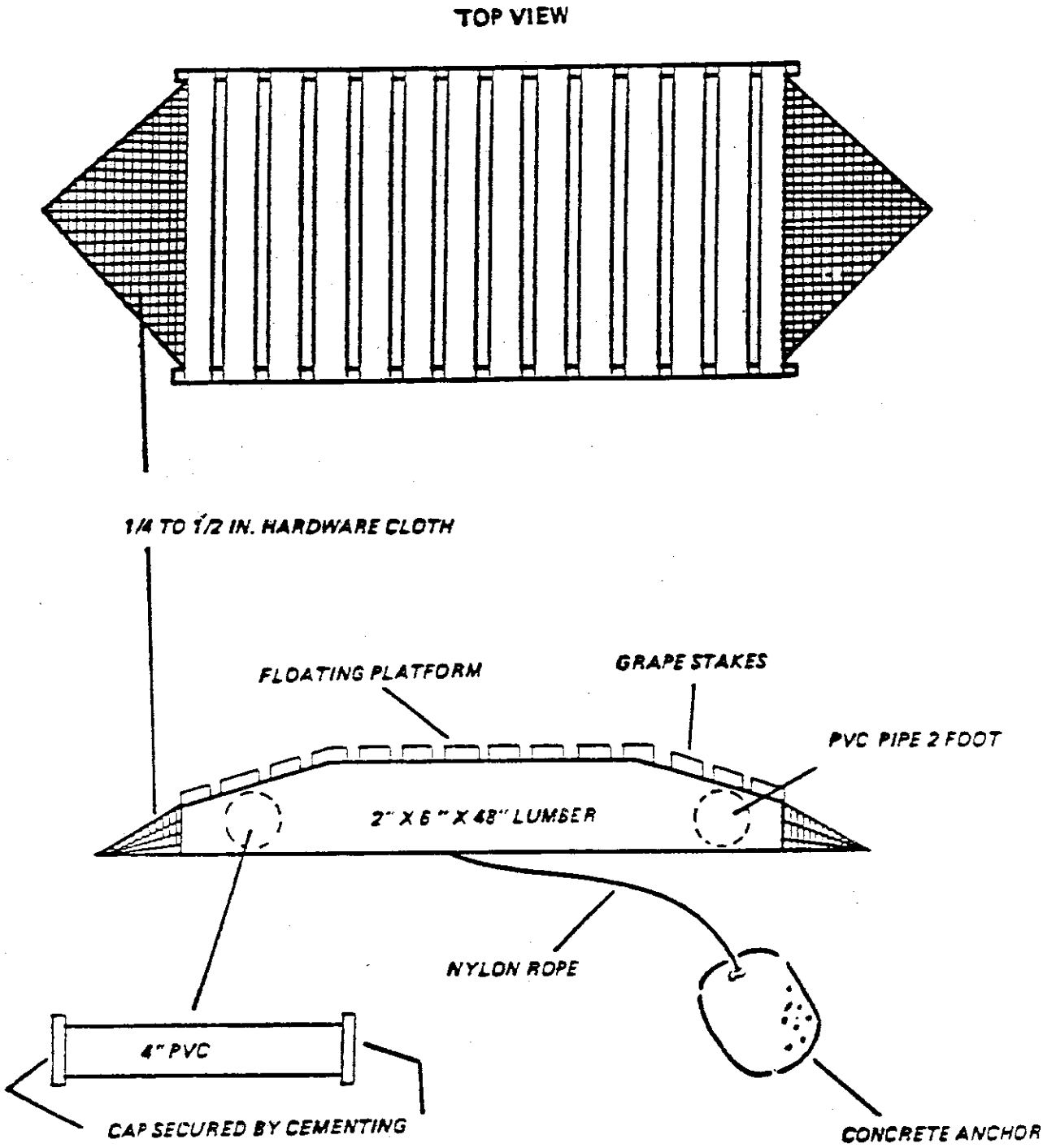
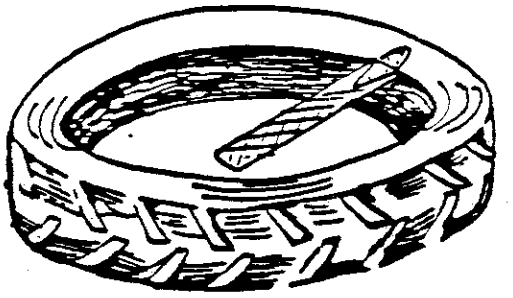
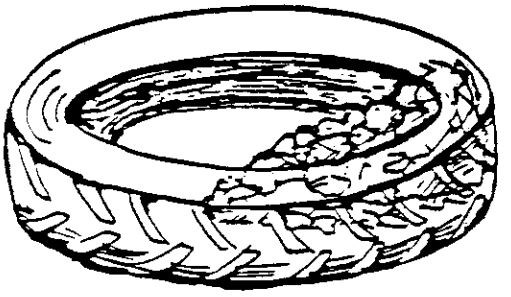


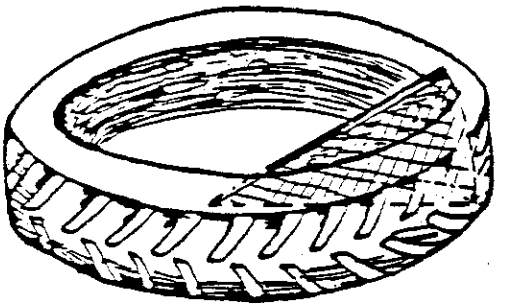
ILLUSTRATION 14: Floating wildlife platforms recommended for large open storage tanks.

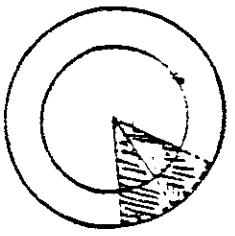


Wood ramp with strap hinge, covered with 1/2" hardware cloth.
Length of ramp should be a least 18" greater than depth of tank.



Rocks piled loose or cemented to form ramp.

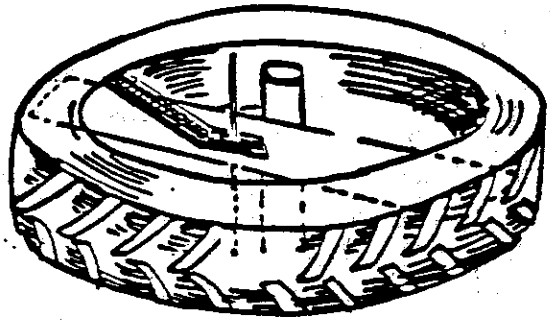




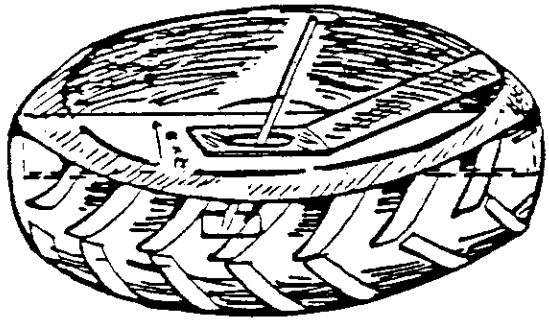
Expanded metal ramp (can be modified for other circular troughs)

Equipment tire water troughs

ILLUSTRATION 16

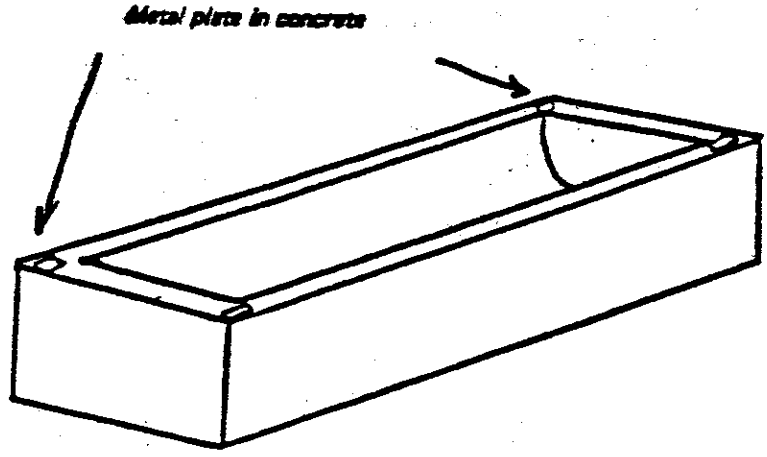


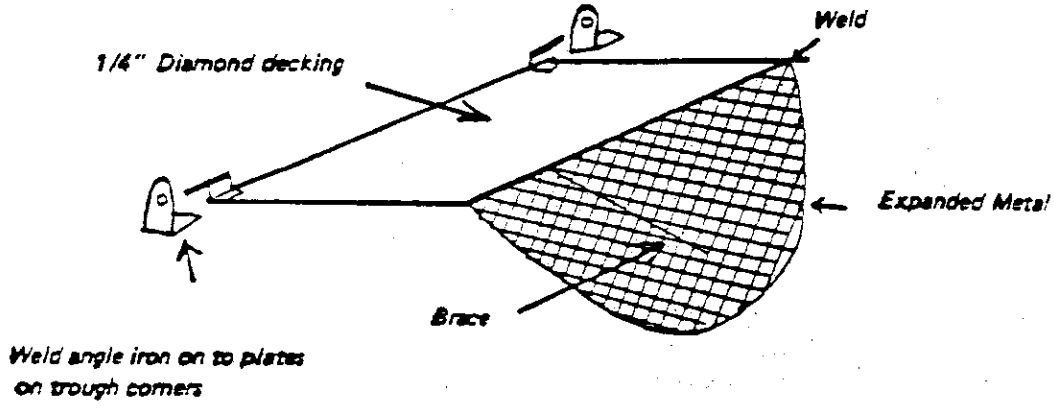
Floating board—ramp – offset mount



Floating board-ramp – center mount

ILLUSTRATION 17

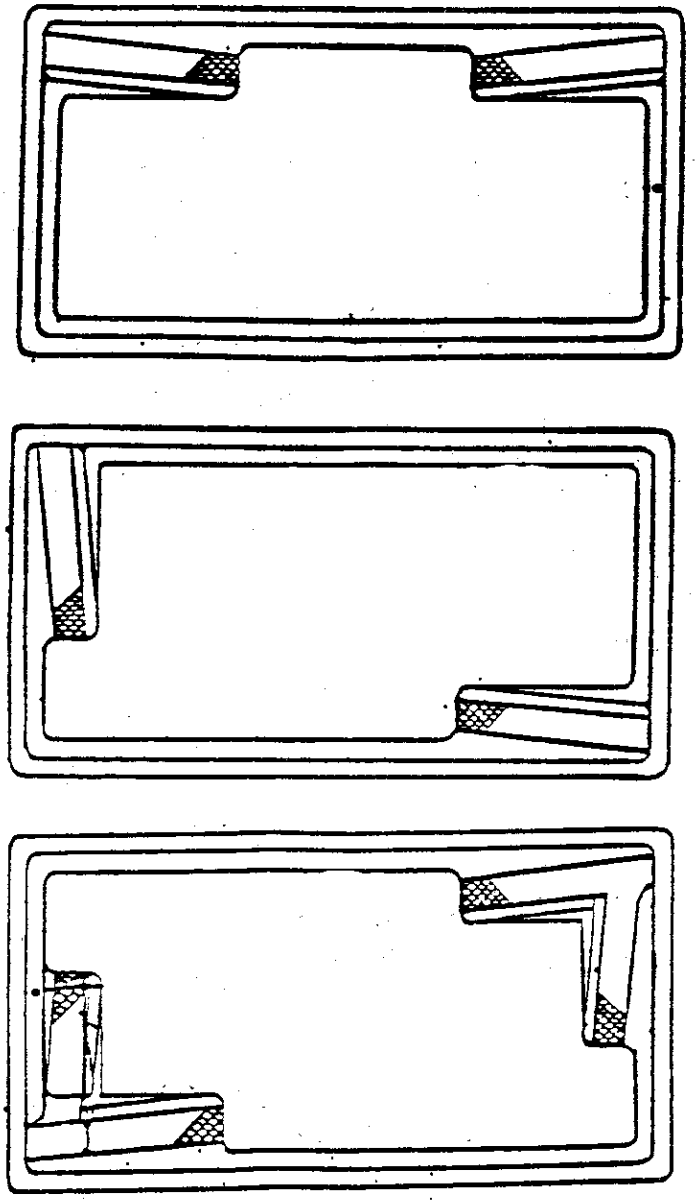




Round bottom cement trough

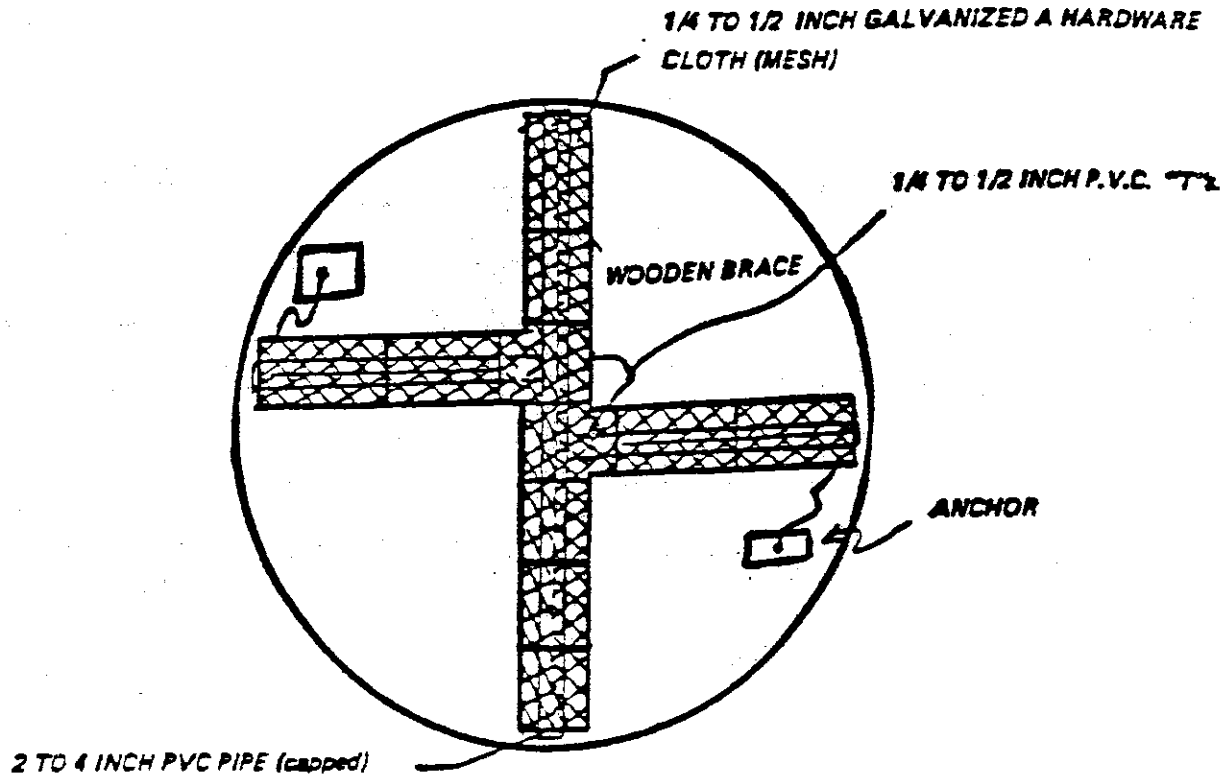
ILLUSTRATION 18

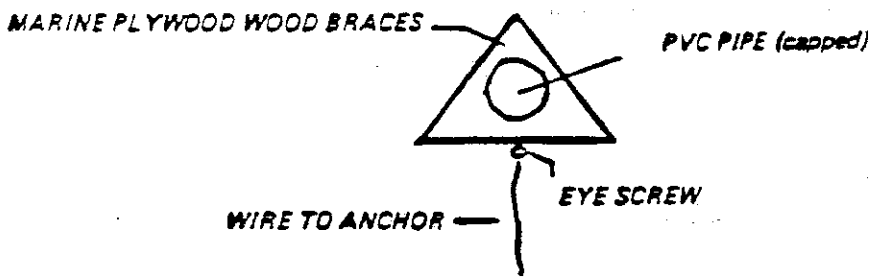
Preferred wildlife ramp locations.



These ramps could be molded in concrete or fiberglass troughs. For metal troughs the ramps may be constructed of wood or metal and attached. Note: these ramps are fully enclosed to prevent entrapment.

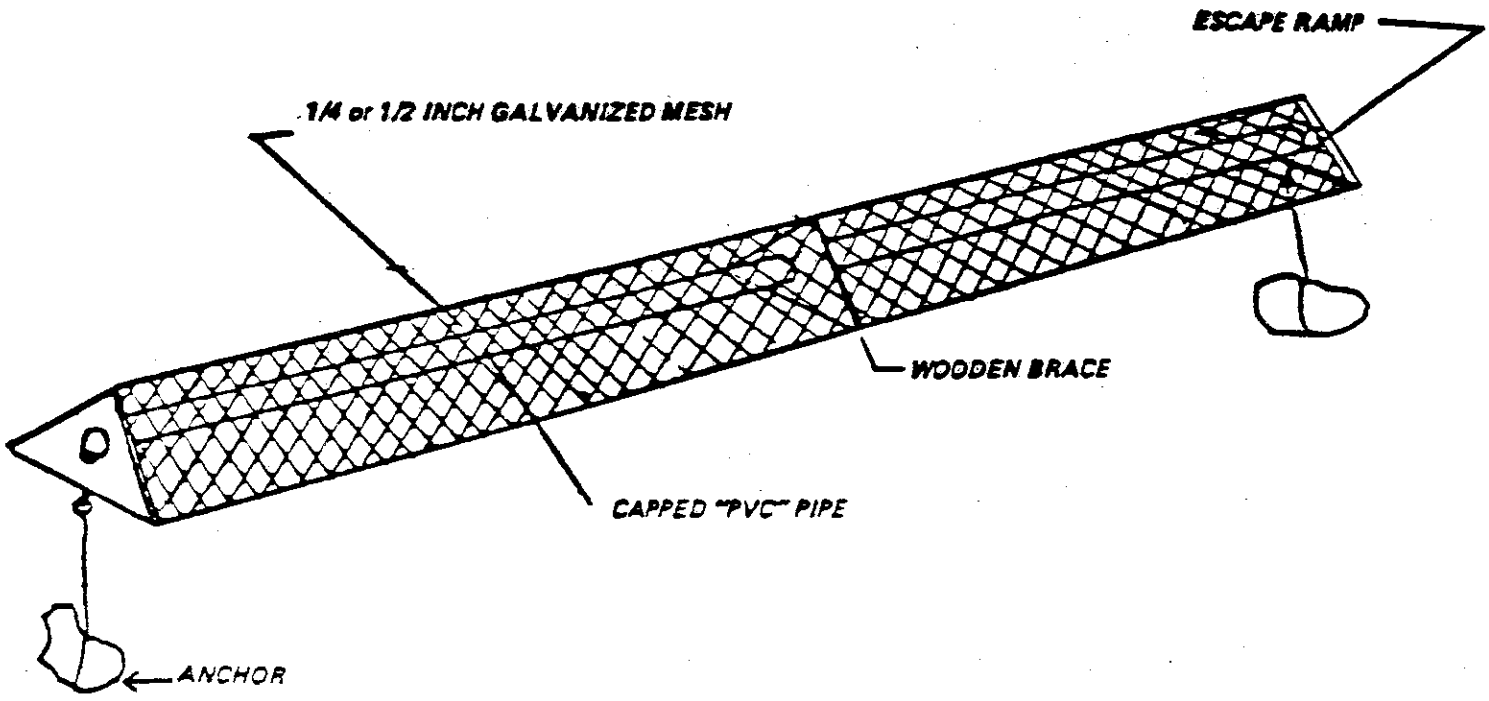
ILLUSTRATION 19: Preferred wildlife ramp locations





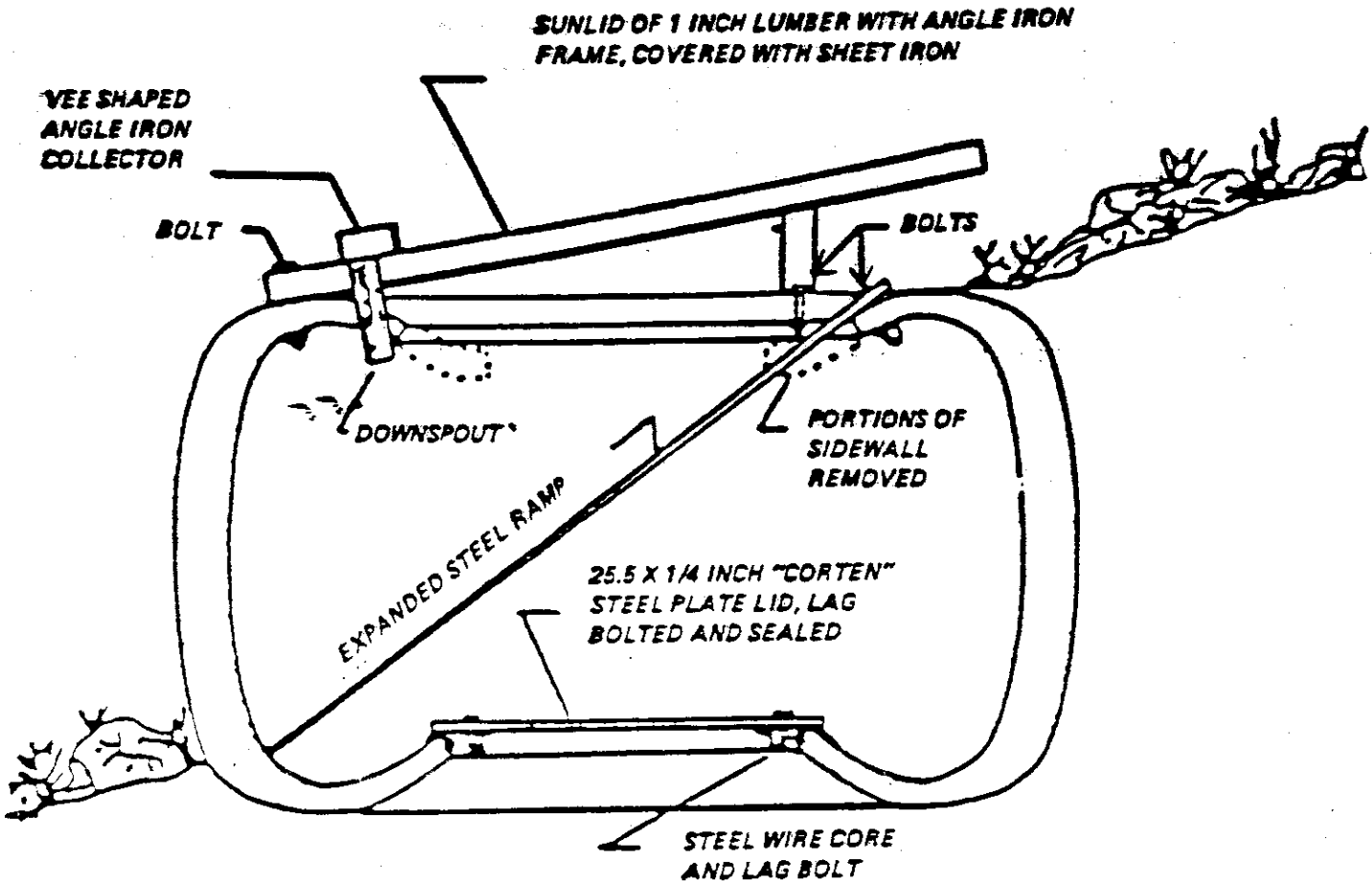
"PVC" escape ramp for circular troughs

ILLUSTRATION 20



"PVC" Escape ramp for straight troughs

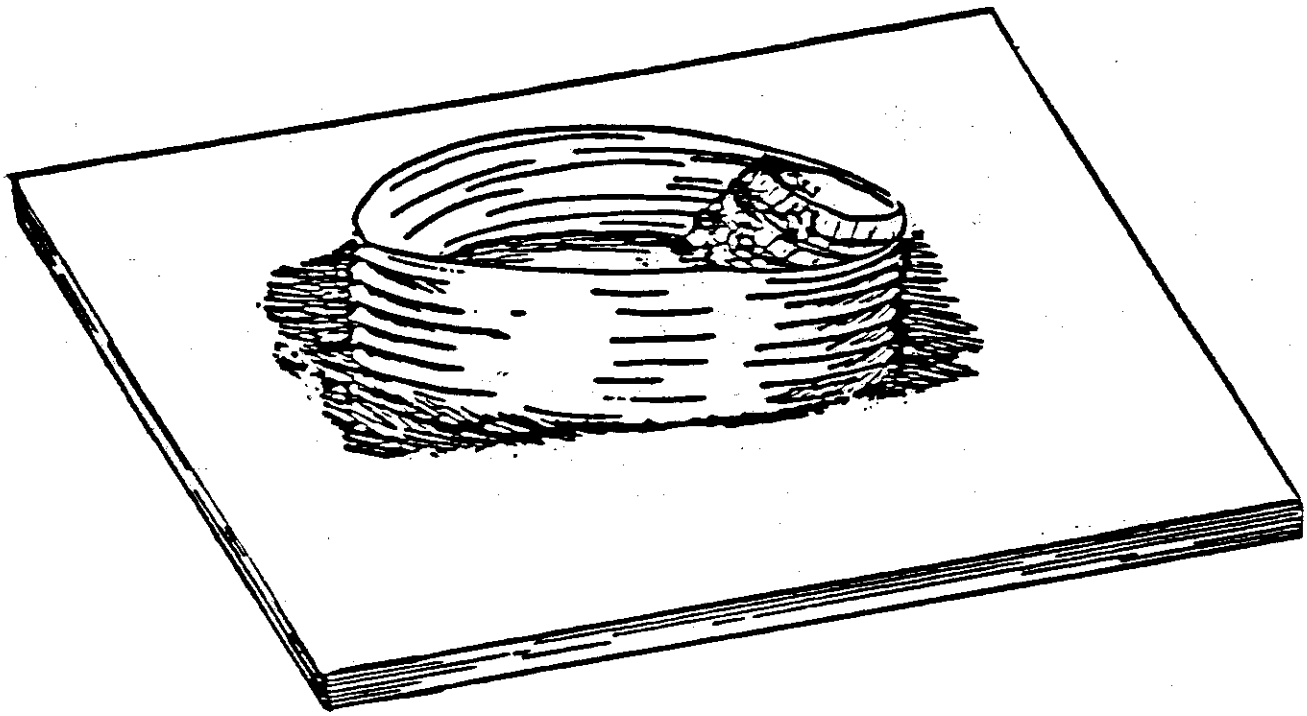
ILLUSTRATION 21



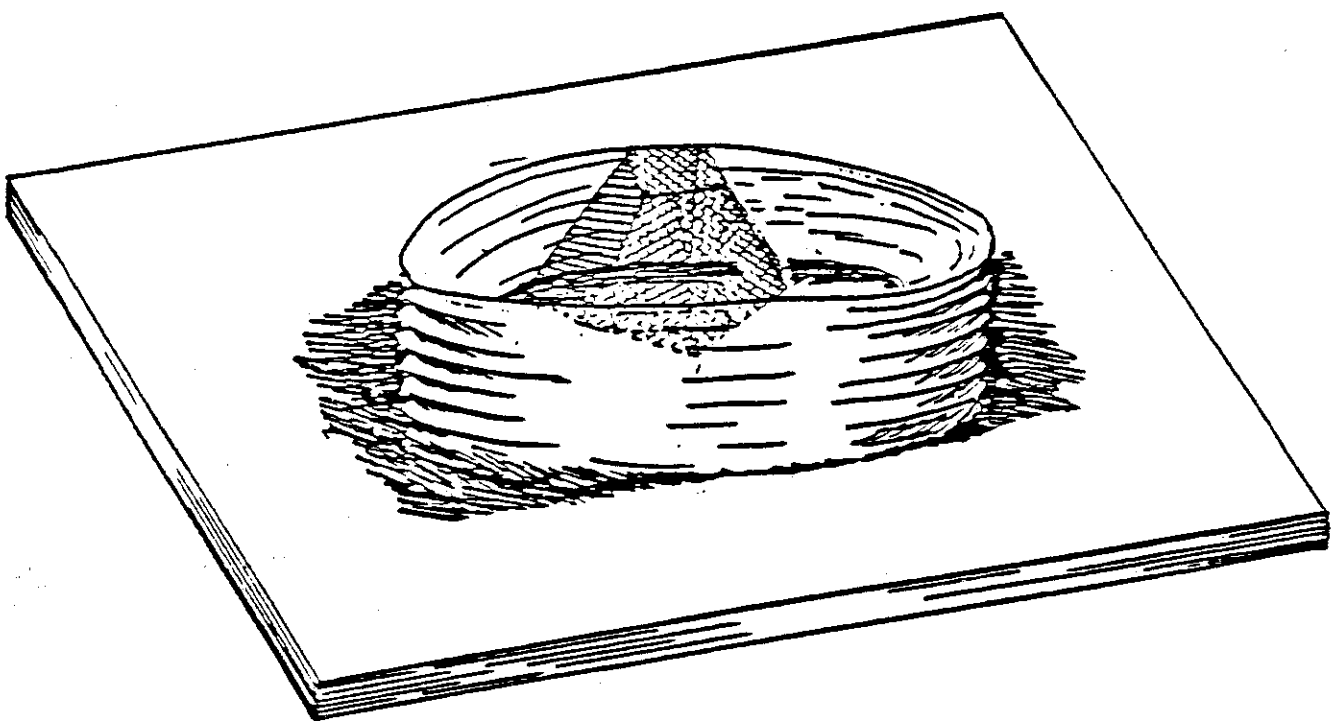
A CROSS-SECTIONAL VIEW OF A GUZZLER CONSTRUCTED FROM A LARGE TIRE

ILLUSTRATION 22

Sloped concrete ramps for wildlife and livestock.

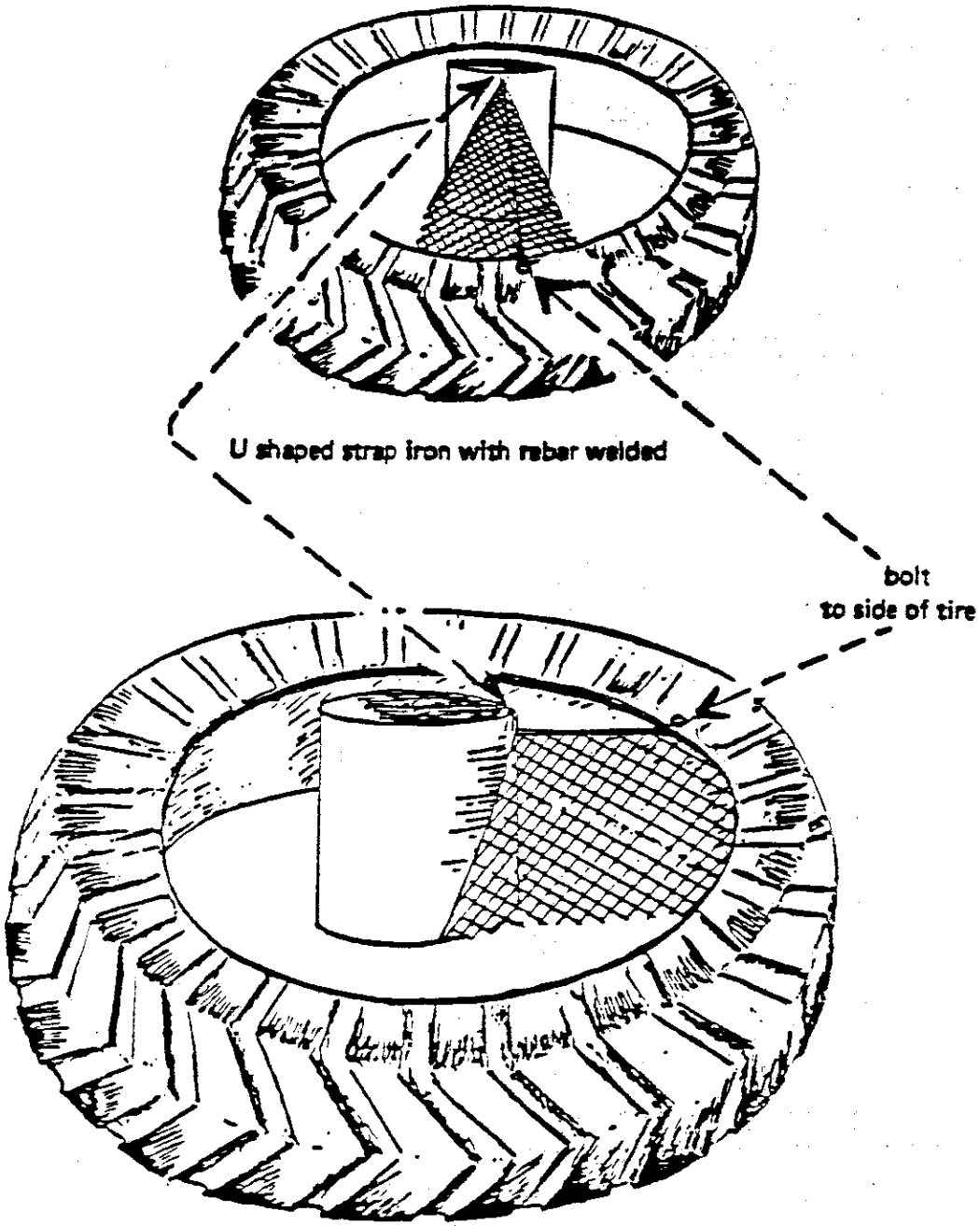


Expanded metal wildlife ramp and float protector (can make hinged opening on top or sides for access to float))



Ramps for metal tanks

ILLUSTRATION 23

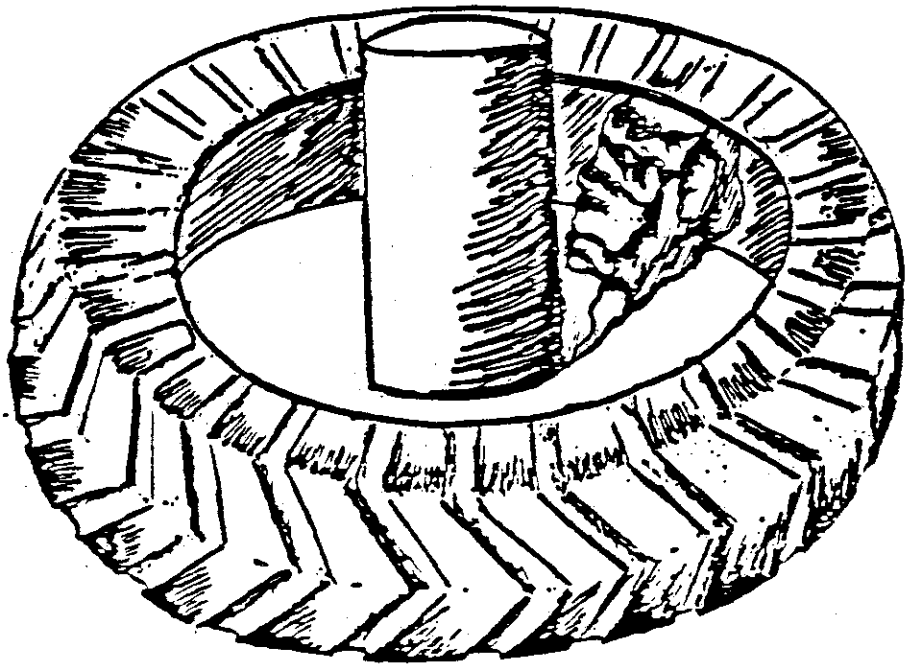


Large equipment tires with cement float protector (top covered)

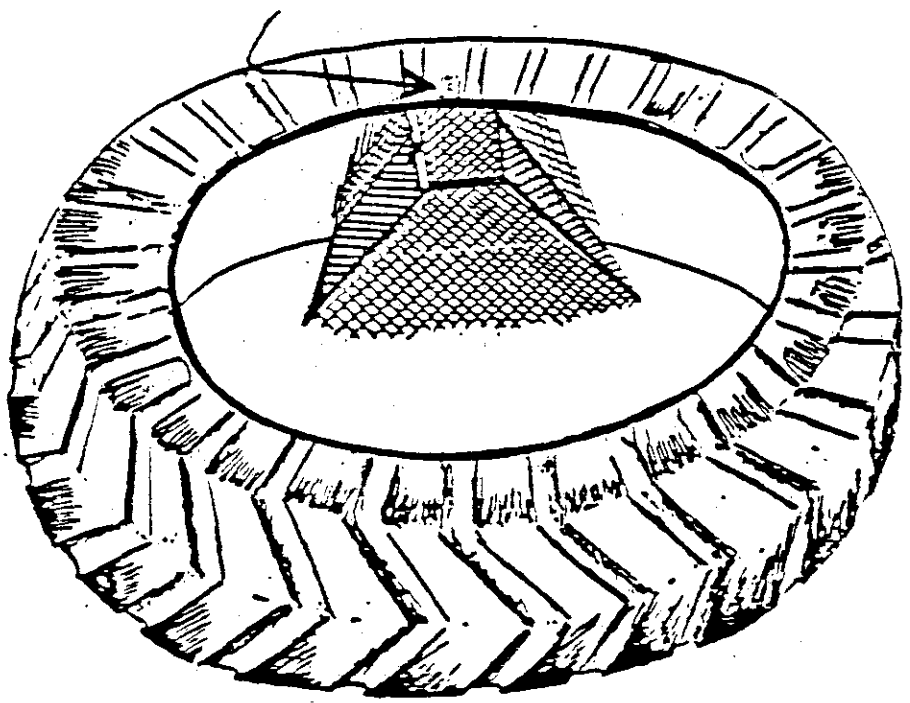
Ramps for equipment tire

ILLUSTRATION 24

Cemented rock ramp



bolt holds ramp to side of tire



expanded metal wildlife escape ramps and float protector

ILLUSTRATION 25

References

Elderkin, Robert L. Jr. and James Morris. Design for a Durable and inexpensive Guzzler. Wildl. Soc. Bull. 17: 192-194. 1989.

Ferguson, James R. BLM Wildlife Biologist (Illustration 19).

Numerous US Forest Service and BLM personnel.

Wilson, Lanny O. 1977. Guidelines and Recommendations for Design and Modification of Livestock Watering Developments to Facilitate Safe Use by Wildlife. Technical Note 305. BLM.